CLAIMS:

1. A process for producing oxygenated products from an olefin-rich feedstock, which process comprises reacting, in a hydroformylation stage, a Fischer-Tropsch derived olefinic product comprising linear and methyl branched α-olefins obtained by subjecting a synthesis gas comprising carbon monoxide (CO) and hydrogen (H_2) to such Fischer-Tropsch reaction conditions in the presence of a suitable Fischer-Tropsch catalyst to obtain said Fischer-Tropsch derived olefinic product, with carbon monoxide and hydrogen in the presence of a catalytically effective quantity of a hydroformylation catalyst and under hydroformylation reaction conditions, to produce oxygenated products comprising linear and methyl branched aldehydes and/or linear and methyl branched alcohols.

2. A process for producing oxygenated products, which process comprises

subjecting, in a Fischer-Tropsch reaction stage, a synthesis gas comprising carbon monoxide (CO) and hydrogen (H_2) to such Fischer-Tropsch reaction conditions in the presence of a suitable Fischer-Tropsch catalyst, to obtain linear and methyl branched olefinic products;

optionally, working up the linear and methyl branched olefinic products to remove unwanted components therefrom and/or to separate a particular olefinic component comprising linear and methyl branched α-olefins therefrom; and

feeding the linear and methyl branched α-olefinic products or the olefinic component comprising linear and methyl branched α-olefins as a feedstock to a hydroformylation stage in which the feedstock is reacted with carbon monoxide and hydrogen in the presence of a catalytically effective quantity of a hydroformylation

catalyst and under hydroformylation reaction conditions, to produce oxygenated products comprising linear and methyl branched aldehydes and/or linear and methyl branched alcohols.

3. A process according to Claim 2, wherein the Fischer-Tropsch catalyst is iron-based, and comprises iron and/or iron oxides which have been precipitated, fused, or impregnated on a carrier/support.

4. A process according to Claim 3, wherein the Fischer-Tropsch reaction stage comprises a fluidized bed reactor, and wherein the Fischer-Tropsch reaction conditions include a reaction temperature of between 300°C and 340°C.

5. A process according to Claim 4, wherein the Fischer-Tropsch catalyst is that derived from the fusion of magnetite with an oxide or a metal of Mn, Ti, Mg, Cr, Ca, Si, Al or Cu or combinations thereof, as structural promoter, and an alkali oxide as a promoter for influencing product selectivities.

6. A process according to Claim 5 wherein, in the Fischer-Tropsch catalyst, the alkali oxide to structural promoter mass ratio is between 0:1 and 20:1, and wherein the structural promoter content thereof expressed as grams of structural promoter per 100 grams Fe, is between 0,1 and 2.

7. A process according to any one of Claims 2 to 6 inclusive, wherein the branched olefins comprise mono-methyl and/or dimethyl α-olefins so that the linear and methyl branched aldehydes, when present, comprise mono-methyl and/or dimethyl aldehydes, and the alcohols, when present, comprise mono-methyl and/or dimethyl alcohols, with the hydroformylation stage feedstock

optionally including non-olefinic components with different functional groups.

8. A process according to any one of Claims 2 to 7 inclusive, wherein the Fischer-Tropsch reaction stage and the hydroformylation stage are integrated so that the olefinic products from the Fischer-Tropsch stage pass directly to the hydroformylation stage with at most said working up of the olefin products and intermediate storage thereof between the stages taking place.

9. A process according to Claim 8, wherein the carbon monoxide and hydrogen required for the hydroformylation are in the form of sulphur-free synthesis gas, which is the same as that used in the Fischer-Tropsch reaction stage.

10. A process for producing oxygenated products, which process comprises

subjecting, in a Fischer-Tropsch reaction stage, a synthesis gas comprising carbon monoxide (CO) and hydrogen (H_2) to such Fischer-Tropsch reaction conditions in the presence of a suitable Fischer-Tropsch catalyst, to obtain an olefinic product;

without working up the olefinic product to remove unwanted components therefrom and/or to separate a particular olefinic component therefrom, feeding the olefinic product as a feedstock to a hydroformylation stage in which the feedstock is reacted with carbon monoxide and hydrogen in the presence of a catalytically effective quantity of a hydroformylation catalyst and under reaction conditions, to produce oxygenated products comprising aldehydes and/or alcohols, with any non-olefinic components present in single or multiple carbon number fractions in the Fischer-Tropsch reaction stage product, then acting as a reaction medium and/or a solvent medium in the hydroformylation stage.

11. A process according to Claim 10, wherein the Fischer-Tropsch reaction stage comprises a slurry bed reactor, and wherein the Fischer-Tropsch reaction conditions include a reaction temperature of between 190°C and 270°C.

12. A process according to Claim 10, wherein the Fischer-Tropsch reaction stage comprises a fixed bed reactor, and wherein the Fischer-Tropsch reaction conditions include a reaction temperature of between 200°C and 250°C.

13. A process according to Claim 11 or Claim 12, wherein the Fischer-Tropsch catalyst includes an oxide or a metal of Mn, Ti, Mg, Cr, Ca, Si, Al or Cu or combinations thereof, as a structural promoter, and an alkali oxide as a promoter for influencing product selectivities.

14. A process according to Claim 13 wherein, in the Fischer-Tropsch catalyst, the alkali oxide to structural promoter mass ratio is between 0:1 and 20:1 and wherein the structural promoter content thereof, expressed as grams of structural promoter per 100 grams active element of the Fischer-Tropsch catalyst, is between 10 and 40.

15. A process according to any one of Claims 10 to 14 inclusive, wherein the Fischer-Tropsch catalyst is cobalt-based, and comprises cobalt and/or a cobalt oxide which has been precipitated, sintered or impregnated onto a support.

16. A process according to Claim 15, wherein the cobalt-based catalyst comprises an oxide of Ti, Mn, Si, Al or combinations thereof as the support, and a metal and/or an oxide of Pt, Ru, Zr, Re or combinations thereof, as a promoter.

17. A process according to Claim 15 or Claim 16, wherein the cobalt catalyst has the following composition:

5-30g cobalt per 100g of support; and

0-10g promoter per 100g of support.

18. A process according to any one of Claims 10 to 17 inclusive, wherein the Fischer-Tropsch reaction stage and the hydroformylation stage are integrated so that the olefinic product from the Fischer-Tropsch stage passes directly to the hydroformylation stage with at most said intermediate storage thereof between the stages taking place.

19. A process according to Claim 18, wherein the carbon monoxide and hydrogen required for the hydroformylation are in the form of sulphur-free synthesis gas, which is the same as that used in the Fischer-Tropsch stage.

20. A process according to any one of Claims 2 to 19 inclusive, wherein the Fischer-Tropsch reaction conditions include an inlet synthesis gas pressure to the reaction stage of between 1 and 50 bar, and a H_2:CO molar ratio of 1,5:1 to 2,5:1 in respect of the synthesis gas.

21. A process according to Claim 20, wherein a gas recycle to the reaction stage is optionally employed with the ratio of the gas recycle rate to the fresh synthesis gas feed rate, on a molar basis, being between 1:1 and 3:1, and wherein a space velocity, in m^3 (kg catalyst)$^{-1}$ hour^{-1}, of from 1 to 20 is used in the reaction stage.

22. A process according to any one of Claims 1 to 21 inclusive, wherein the hydroformylation catalyst is a phosphine and/or phosphite ligand modified rhodium (Rh), cobalt (Co) or ruthenium (Ru) homogeneous catalyst.

23. A process according to Claim 22, wherein the hydroformylation catalyst is a tri-aryl phosphorous derivative used as a ligand with rhodium, or an alkyl phosphorous derivative used as a ligand with cobalt.

24. A process according to Claim 23, which includes introducing a rhodium, cobalt or ruthenium metal precursor and the phosphorous derivative separately into the hydroformylation process stage, with the catalyst then forming in situ.

25. A novel process for producing oxygenated products, substantially as described and illustrated herein.

26. Oxygenated products when produced by the process of any one of Claims 1 to 25 inclusive, and/or derivatives thereof.

27. Mono-methyl and/or dimethyl branched alcohols and/or aldehydes, when produced by the process of any one of Claims 1 to 25 inclusive, and/or derivatives thereof.